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ABSTRACT

To benefit from the support of public and private sector leaders and to ensure that all students receive effective services, the adult education system must identify program models that have empirical evidence to support claims of effectiveness. The U.S. Department of Education's Institute of Education Sciences defines evidence-based education as "the integration of professional wisdom with the best available empirical evidence in making decisions about how to deliver instruction." An evidence-based adult education system would have the following components: (1) basic and applied research; (2) program model evaluation; and (3) practitioner knowledge. These three components would work together in a cycle that continually improves program models. The main steps in establishing an evidence-based adult education system are as follows: (1) define groups of students to focus on in the initial baseline program evaluations; (2) for each group of students, identify specific achievement outcomes and tools for measuring them; (3) choose a few groups to begin with first; (4) support a team to develop the baseline program models for each group; (5) engage research methodology experts to design an evaluation of the baseline program models; and (6) publish a detailed description of the baseline program models and the program model evaluation methodology. (Contains 28 references.) (MN)

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Establishing an Evidence-based Adult Education System

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Establishing an Evidence-based Adult Education System

Introduction

In 2002, the National Center for the Study of Adult Learning and Literacy (NCSALL) published *Building a Level Playing Field,*[3] which made the case for investment in the adult education system by public and private sector organizations. The adult education system refers to the adult basic education (ABE), adult English for speakers of other languages (ESOL), and adult secondary education (ASE) programs supported by federal, state, local, and private funds. The adult education system provides literacy, math, English language, and high school certification programs to around three million adults each year.

Leaders from government, business, health, and other sectors found the case for investment compelling but wanted to know which program models (instruction and support services[4]) they should support with both their funds and their influence on public policy. The adult students who participate in adult education services are also investors in the adult education system. They invest their time with the hope that participation in these programs will improve their lives. If students knew that the services available to them were ineffective, they might choose to invest that time in earning money, enjoying their family, or improving their community. Each student, therefore, should be participating in services that have strong evidence of effectiveness.

To benefit from the support of public and private sector leaders and to insure that all students receive effective services, the adult education system must identify program models that have empirical evidence to support claims of effectiveness. Unfortunately, the adult education system does not have well-defined program models that are based on research and have strong evidence of effectiveness.

In the adult education system, practitioners sometimes base their decisions on theories of adult learning (Merriam & Caffarella, 1999) that draw on research in education or in other disciplines. Most practitioners, however, base their decisions on tradition, the opinion of experienced practitioners, or personal experience gained through trial and error (Beder & Medina, 2001). Both of these approaches, theory-based and experience-based, can lead to decisions that support effective learning, but the program models that have grown out
of these approaches do not have strong evidence of their effectiveness.

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[3] http://ncsall.gse.harvard.edu/research/op_comings2.pdf

[4] This paper assumes that adults need both instruction and support services to be successful in learning.

Proponents of evidence-based education[5] suggest that practitioners and policymakers should base decisions on the findings of scientific research. The proponents of this approach point to medicine as an example of how scientific research can lead to improvements in practice. Medical research uses random assignment experiments as the preeminent tool to decide which clinical practices are most effective, and proponents of evidence-based education believe that this approach will lead to dramatic improvements in education, as it has in medicine.

This paper identifies random assignment experiments as one tool for the development of evidence but defines evidence-based education as a process that is larger than a single research method. This paper draws on a definition put forward by the U.S. Department of Education's Institute of Education Sciences, which defines evidence-based education as:

> *The integration of professional wisdom with the best available empirical evidence in making decisions about how to deliver instruction.*[6]

This definition values the insights of both researchers and practitioners in determining how best to provide educational services. This paper will expand on this definition to describe a process that is adapted to the adult education context.

A cooperative relationship between researchers and practitioners has had a dramatic impact on many fields (Stokes, 1997). For example, health researchers developed a theory that "germs" are the cause of infection and disease, and then medical practitioners put that knowledge into practice. Practitioners identified ways that germs might be transmitted (on a physician's hands, for example) and ways to limit that transmission (hand washing and sterile gloves, for example). Researchers then tested these approaches to assess their effectiveness. Once both researchers and practitioners accepted the germ theory, they were able to work together to dramatically lower disease and infection rates. The field of adult education has no universally accepted theory that defines good practice, nor does it have a tradition of cooperation between researchers and practitioners.

Most practitioners in adult education are interested less in a theory of good practice than in program models that describe the principles of effective instruction and support services. A **program model** describes what adult students, teachers, counselors, administrators, volunteers, and program partners (such as businesses, unions, health centers, and training programs) should do to provide effective instruction and support services. A cooperative relationship between researchers and practitioners in adult

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[5] For example, see http://www.ed.gov/pubs/stratplan2002-07/index.html for the Department of Education's *Strategic Plan 2002 – 2007*, http://www.edexcellence.net/library/carnine.html for *Why Education Experts Resist Effective Practices* by Douglas Carnine, and http://www.aera.net/pubs/er/toc/er3107.htm for *Evidence-Based Education Policies: Transforming Educational Practice and Research* by Robert Slavin.

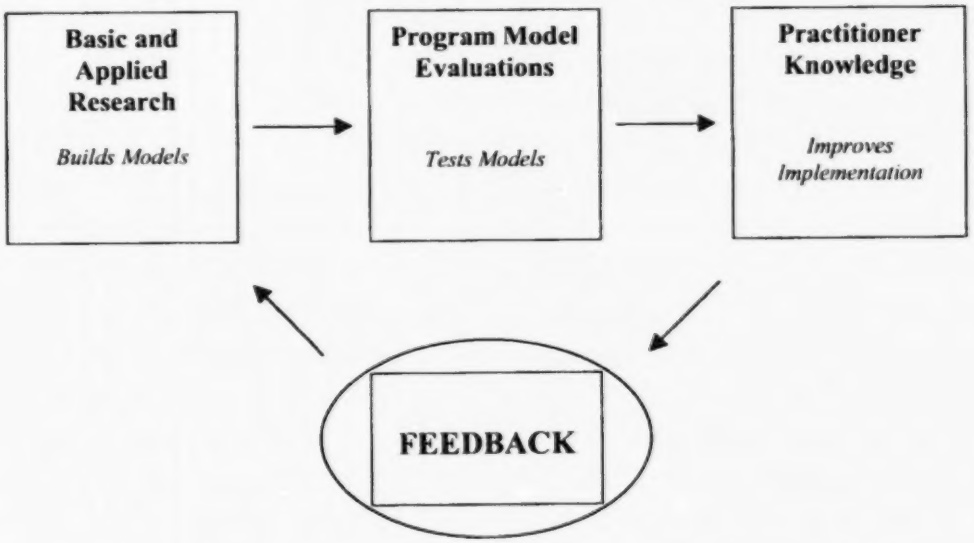
[6] This quotation can be viewed at http://www.ed.gov/offices/IES/speeches/evidencebase.html

education could lead to program models that are based on empirical evidence, have proof of effectiveness, and draw on the knowledge practitioners gain as they implement these program models.

This paper describes an approach to evidence-based adult education and proposes a way to establish an evidence-based adult education system. The evidence-based adult education system presented here requires a close collaboration between researchers and practitioners. This collaboration must be built on a common vision and a respect for the strengths that each brings to this effort. For this system to work, however, policymakers would have to structure funding and administrative procedures in ways that support the adoption of evidence-based adult education practices. The goal of this paper is to convince researchers, funding agencies, policymakers, practitioners, and adult students to support the establishment of an evidence-based adult education system.

An Evidence-based Adult Education System[7]

An evidence-based adult education system would have three components: **basic and applied research** that provides evidence to build program models, **program model evaluation** that tests the effectiveness of program models, and **practitioner knowledge** that improves implementation of program models. These three components would work together in a cycle that continually improves program models.



The result of this cycle would be clear definitions of effective program models, but these definitions would change as the cycle continues to improve the program models.

[7] This description of research and evaluation practices draws from: Light, Singer, & Willett (1990); Jaeger (1990); and Jarvis (1999).

Basic and Applied Research: Building Program Models

In this system, basic and applied research produces knowledge that defines program models of instruction and support services. Basic research is motivated by intellectual interest alone and is concerned with knowledge for its own sake, while applied research is directed toward solving immediate and practical problems (Merriam & Simpson, 1995). This component employs a wide range of research methods, both qualitative and quantitative, to explore instruction and support services and develop knowledge that suggests which approaches might be most effective. The basic and applied research component identifies elements of a program model that are likely to be effective and excludes ineffective elements.

The basic and applied research component does not privilege any particular research method; a study's research method should be appropriate for the question it is trying to answer. This component employs surveys, ethnographies, longitudinal studies, grounded theory studies, action research, portraiture, case studies, and experimental, quasi-experimental, and correlational studies. Each research method has rules that govern data collection and analysis, and only evidence from studies that conform to those rules is useful to decision making. Peer reviewers, researchers who know the research method but are not involved in the study, determine whether a study conforms to the rules.

The best available evidence from basic and applied research identifies program models that should be effective. The decision as to which studies produce the "best available evidence" is based on the number of studies that support the same findings and the level of adherence to the rules of the research method employed by each study. Until the evaluation component proves otherwise, program models that are designed based on evidence from basic and applied research should be considered effective, since they are built on a foundation of the best available evidence.

In this component, researchers bring knowledge of the previous research and theory in their field, while practitioners bring their direct experience of helping adults learn. They should work together to identify research questions. A collaborative decision making process, which benefits from these two perspectives, ensures that this component pursues the most useful questions.

Program Model Evaluation: Testing Program Models

In this system, evaluation tests program models to see if they work or to see which program model works best. Program models are tested with two groups of students: the treatment group receives an intervention (the program model) and the control or comparison group does not. A control group is formed by random assignment, while a comparison group is formed by identifying students who are similar to those in the treatment group. Program model evaluation can also compare two or more treatments at

the same time to identify which is most effective. Program model evaluation employs a narrow range of research methods, and some research methods provide stronger evidence than others.

In program model evaluation, the strength of the evidence is judged, in part, by the likelihood that the outcome measure (learning gains) is caused by the treatment (program model) rather than some other factor such as student motivation or educational background, teacher's skill or personality, or class size. Program model evaluation has a hierarchy of methods, and a study that employs a method that is higher on the hierarchy provides stronger evidence than one lower down. Research methods at the top of the hierarchy are more likely than those at the bottom to rule out the possibility that some factor other than the treatment is the cause of the outcome. As with basic and applied research, each method has rules as to how data should be collected and analyzed, and the level of adherence to the rules is judged by peer review. In addition, several studies with the same findings provide stronger evidence of effectiveness than does a single study. The hierarchy of methods[8] for the program model evaluation component is:

- **Experimental** employs two identical groups of participants that are randomly assigned to treatment and control groups.

- **Quasi-experimental** employs treatment and comparison groups that are not randomly assigned but appear identical, though they may have unseen differences. Statistical controls (mathematical operations) allow researchers to compensate for the differences between the treatment and comparison groups.

- **Correlational with statistical controls** employs treatment and comparison groups that are not identical, but researchers use statistical controls to compensate for differences that may be important.

- **Correlational without statistical controls** employs treatment and comparison groups that are different, but researchers assume that the differences may not be important, since the sample (the students in the study) is usually large.

- **Case study** may employ only a treatment group and assumes that differences among participants are not important or are obvious, since the sample is usually small.

Since most practitioners are not familiar with these methods, an example might be helpful to build an understanding of its importance. An important question in adult

[8] This hierarchy is adapted from a December 18, 2001 speech by Grover J. (Russ) Whitehurst, Director of the Institute of Education Sciences, which can be viewed at http://www.ed.gov/offices/IES/speeches/index.html

education is whether to allow open enrollment classes (where students may begin instruction on any day) or to impose managed enrollment (where students must begin instruction on a specific day). Open enrollment classes offer learning opportunities to students who cannot attend class on a regular schedule, but since each student is at a different point in the curriculum, instruction must be individualized. Managed enrollment classes exclude students whose schedules are always changing, but group instruction is easier since every student is at the same point in the curriculum. If students perform well in both types of classes, programs should be encouraged to offer the type of class that best fits the needs of their students. If one of the types works well and the other does not, programs should be encouraged to offer only the type that works.

The following are examples of how each of the five methods might answer a specific question: Do students who are in managed enrollment classes demonstrate higher learning gains than students who are in open enrollment classes? In each case, all students would be given a pre-test and a post-test to judge their achievement.

- With the experimental method, two sets of classes would be established, one with managed enrollment and one with open enrollment. Except for the enrollment procedure, all aspects of the classes (such as the materials, amount of class time, and instructional approach) would be the same. Students would be randomly assigned to one or the other of these two types of classes.

- With the quasi-experimental method, the study would identify a group of open enrollment classes. Half of the classes would then institute managed enrollment. Another quasi-experimental approach would be to have all of the classes change to managed enrollment and measure the achievement of students in the year before the change and in the year after the initiation of managed enrollment.

- With the correlational with statistical controls method, data would be collected from programs that have open enrollment and those that have managed enrollment. All of the ways in which the programs and students might be different are entered into the database, and then students and programs are compared with those that look most like them. For example, the achievement of minority students would be compared with each other or programs in urban areas would be compared with each other.

- With the correlational without statistical controls method, the study would employ the same procedure as above, but researchers would study a very large sample (all programs in the country, for example) and then compare all students in open enrollment classes with all students in managed enrollment classes.

- With the case study method, researchers would closely follow the change from open enrollment to managed enrollment in several classes or study classes that fall into both types. The study would describe in detail what has occurred because of the change or the difference between the two types of classes.

All five methods try to ensure that the two groups of programs and students are the same except for their type of enrollment procedure. The experimental method accomplishes this by establishing classes that are the same except for enrollment procedure and then assigning students randomly so that each group of classes has the same mix of students. This method provides the strongest results because it rules out most other reasons for why achievement might be different between the two groups. The other four methods provide evidence that is not as strong, but for some questions, they offer the only possible evaluation approaches.

Ethical, logistical, or budgetary constraints sometimes make the experimental method difficult or impossible to employ. For example, medical researchers use experiments to test the effectiveness and safety of drugs by randomly assigning patients to a medication or a placebo (a pill that looks just like the real medication but contains no medication). This simple procedure is ethically sound because the researchers do not know for sure that a drug is safe and effective until it is tested. However, the same researchers might choose a quasi-experimental design to test whether or not strict auto emissions controls might lower childhood asthma cases, since it would be impossible to assign children randomly to live in cities that did or did not have strict auto emissions controls. Correlational studies could look at children in cities that already have strict controls and compare them to children in cities that have lax controls, but cities with stricter controls might have more affluent populations. Statistical controls help researchers look only at groups of children whose families have similar incomes in the two types of cities. If this type of data were unavailable, researchers might undertake a case study of two similar cities that have different auto-emission rules or study a community when it changes its rules to become stricter.

Collaboration between researchers and practitioners is critical in this component. Since practitioners understand their students and the dynamics of their classes, researchers need their help in designing a study. For the same reasons, practitioners in a study are also an independent source of data, and their insights are essential to the analysis of the data collected.

Practitioner Knowledge: Improving Implementation of Program Models

After basic and applied research and program model evaluation suggest what should be done, practitioners develop approaches to using this advice in ways that work best for their students. For example, research by Purcell-Gates (2000) found that positive changes in student reading habits resulted when teachers focused instruction on texts that related to real and immediate literacy demands in the lives of their adult students. While teachers might find it impossible to abandon commercial materials and build a unique curriculum around the interests of each individual student, they could develop many ways to link commercial materials with materials each student brings from their home. As teachers struggle with how to include authentic materials in instruction, they develop practitioner knowledge that should be shared in their program and with other programs.

The role of practitioner knowledge is not limited to the field of education. In an editorial in the *Journal of the American Medical Association*, Donald Berwick (1996) makes the case that practitioner knowledge is important to making the findings from scientific research work better in the field of heart surgery. He cites an example of a group of surgeons in Massachusetts who came together to learn why some of them had lower patient mortality rates during surgery than others, even though they were all following the same evidence-based practices. The difference in mortality rates was not caused by a difference in practice but in how the practitioner performed the practice. They observed each other's work, talked, debated, and learned from each other, and they lowered mortality rates among their patients by 24 percent. Their closeness to the processes of surgery allowed them to reflect on the possible causes and effects that a more distant investigator could only have discovered more slowly. Engaging in this investigation as a community of practitioners freed them from their respective blind spots.

Though the practitioner research Berwick describes did not conform to the experimental method favored in medicine, it did provide valuable advice that improved the existing program model for surgery. Berwick likens the study to the action and reflection that takes place in quality circles in private enterprise and to John Dewey's model of learning, which he describes as action, guided by theory, and then reflection on that action. As with quality improvement in a factory or learning in a class, the process of group inquiry produced powerful positive changes. The development of practitioner knowledge should be supported as part of evidence-based adult education, and it should be systematically recorded and shared.

Practitioner knowledge is also a rich source for hypotheses about why a program model does not work with some students and how to improve it. This knowledge should feed into the basic and applied research component. Practitioners should be involved in all stages of the cycle, but they have primary responsibility for this component.

Limits on Evidence-based Adult Education

Research and evaluation only works well when the expected outcomes of education are clearly defined. Without a clear definition of the outcomes and good tools to measure those outcomes, the validity (how closely the study measures the outcome) of a study's findings may be suspect. Research and evaluation can measure most types of outcomes. Traditional adult education outcomes, such as reading comprehension or oral vocabulary, could be measured by tests. Behavioral outcomes, such as changes in reading at home or the use of English at work, could be measured by observations and interviews. Outcomes that may be difficult to assess, such as increased critical thinking ability or stronger self-efficacy, could be measured with complicated measurement tools. Some outcomes, such as enhancement of democracy, may be impossible to measure, but these outcomes can sometimes be broken down into parts that could be measured. For example, tools to measure enhancement of democracy might assess changes in voting behavior, participation in advocacy efforts, or knowledge about political issues. An evidence-based adult education system must clearly define outcomes and identify or develop tools that measure those outcomes.

Even with a consensus on outcomes and a way to measure them, program model evaluation rarely identifies a model that works for everyone. For example, an evaluation might show that program model "A" works well with 20 percent of students and model "B" with 60 percent of students. Though this suggests that model "B" should be adopted, additional basic and applied research should explore why it worked with some students and not others. This second research stage might lead to design of a new program model that works well with a larger proportion of students or to the addition of another model, "C," for the 40 percent not served well by model "B." Then, another evaluation takes place to test the new program model. This process of basic and applied research and program model evaluation continues until almost all students are served well, not with a single program model but with a range of models that have been proven effective.

As this process continues, program model evaluation may find that there is a limit to a particular line of inquiry. Program models "A," "B," and "C" (in the present example) might never be successful with more than 75 percent of students. When this happens, researchers may need a new paradigm that identifies barriers to success with the existing program models. The barriers to success may be the effect of poverty, the need for incentives or new support services, or untrained teachers who are implementing the model incorrectly. The basic and applied research component investigates these barriers and proposes another program model that addresses them. This new model must then be evaluated.

Research may provide evidence that is useful but insufficient for program model design. For example, Slavin (2002) explains that research supports the use of mnemonic devices such as, "When two vowels go walking, the first one does the talking," to teach a spelling rule. However, he points out that no one would suggest a program model that

only employs mnemonic devices. In addition, evaluation may provide evidence that a program model works, but it may be a model that is difficult to implement. For example, Folger and Breda (1989) found that children performed better in smaller classes. However, this advice is only useful to schools that have the resources to hire many new teachers who are as well trained and experienced as their present teachers.

The program model evaluation component can lead to advice that works in the research context but does not work in most programs. Once evaluation shows that a program model works in a small, controlled experiment, it should be tested in a variety of programs and with a variety of students to insure its generalizability (an indication of the likelihood that the study findings are true for most adults and programs). Given the difficulty and expense of large-scale program model evaluations, they will always be rare, and so they should be undertaken only after sufficient basic and applied research and small-scale program model evaluation have been completed.

Building an Evidence-based Adult Education System

Adult education programs employ a wide range of practices. For example, a student may receive instruction from a full-time teacher, a part-time teacher, an unpaid volunteer, a computer, or a combination of some or all of these four. A teacher or volunteer could be well trained or might have little training in adult education. Some programs rely on one-on-one tutoring while others have classes. Classes can be as small as a few students or as large as 40. Students may spend two hours or twenty hours a week in class. Some of these differences may not matter. For example, a part-time teacher might provide instruction that is as effective as that of a full-time teacher. Other differences are important. For example, a well-trained teacher presumably would provide better instruction than one who is untrained. Some differences may be important for one group of students but not for another. For example, large classes may not be effective for ESOL students who need a great many opportunities to use English and interact with their teachers and peers. However, large classes might be effective for those studying to pass a high school equivalency test who could benefit from group instruction in math and writing. Basic and applied research can help determine which differences are important, and those identified as important should be taken into account in the design of program models.

Research and evaluation should take place within programs that meet some basic criteria for good design. These criteria define **baseline program models**. An evidence-based adult education system should start with the identification and evaluation of baseline program models that conform to the existing empirical evidence and practitioner knowledge. Since the existing evidence from basic and applied research and program model evaluation is insufficient to be the sole source of program model design, practitioner knowledge is critical to filling in the existing gaps. Baseline program model evaluations would establish a place from which to begin improvement.

Medical research has a baseline model of practice. For example, two approaches to a surgical procedure are always tested in an operating room that meets specific criteria. No medical researcher would test an approach to surgery in a basement or in an operating room that has no nurses to aid the surgeon. The surgeons in these experiments are trained in science, medicine, and surgery and always obey strict rules that protect patients from infection. Similarly, program model evaluation should take place in programs that have teachers and volunteers who are trained and classes that are small enough and include sufficient hours and intensity of instruction to be effective.

Baseline program model evaluations might be difficult to implement as experiments, since the control group would have to be assigned to no educational services or services that are extremely different from the treatment. A quasi-experimental study might be more appropriate. For example, this evaluation could follow cohorts of students as their programs change to meet the standard of the baseline program model. The impact of program improvement should be evident in increasing rates of persistence, achievement, and impact. After these baseline program models have been established, changes in specific components of a program model (or even alternative program models) could be tested with experiments.

NCSALL's ESOL Lab School at Portland State University in Oregon has instituted a baseline program model for entry-level ESOL students that is based on available empirical evidence and practitioner knowledge, and the Lab School is assessing learning gains and impact with cohorts of students who are followed for up to five years. The ESOL Lab School has recently begun testing changes in its program model with random assignment experiments. Students are randomly assigned to one of two identical classrooms, and each teacher works with one cohort of students who receive the first treatment (sustained silent reading) and one cohort that does not. The classes are videotaped so that researchers can check to see if implementation of the intervention followed the research plan. This experience shows that both baseline program model evaluation and random assignment studies are possible in adult education, but this approach to research is expensive and difficult.

Baseline Program Models for Adult Education

A description of a program model must be useful to practitioners who design and run programs. One way to describe programs is to focus on three chronological **program elements**:

1. **Entrance into a program** includes recruitment, which is the way in which programs describe and publicize their services to attract students who are making an informed choice to begin a course of study, and the intake and orientation process, which is the way in which programs assess the needs and goals of students and prepare them to be successful in the program.

2. **Participation in a program** includes instruction, which is the way in which programs support the learning of students so that they can achieve their goals, and support services, which are the way in which programs help students participate, persist, and engage in learning.

3. **Reengagement in learning** is the way in which programs help students resume learning after they have left the program or begin postsecondary education or training after completion of program services.

The most useful baseline program models would help practitioners make decisions about how to design and implement these three elements.

A baseline program model would establish **principles** for program services. A principle describes a guiding assumption about how best to organize the activities of the three elements. These principles would be derived from empirical evidence and practitioner knowledge.

These principles should be defined through a process that balances the advice from evidence and practitioner knowledge with the constraints inherent in the field of adult education. One important constraint is unit cost (cost per student per year). The unit cost should be set high enough to support the three elements of a program but within a limit that funding agencies are willing to support. Other constraints may include the need for multi-level classes and program services that are convenient for workers who have full-time jobs and parents who have family responsibilities.

Depending on the evidence available, a principle might be general or precise. For example, principles of different levels of precision could be defined for two aspects of reading instruction: 1. The skills that are taught and 2. The materials used for reading practice. For skills, a general principle might state that instruction should be built on an assessment of the reading skills of each student. The principle could be more precise and state that instruction should be based on an evaluation of the component skills of reading

rather than on the results of a comprehension test. A more precise principle might identify groups of students based on their component test scores and suggest specific teaching and learning strategies for each group. For materials, a general principle might state that materials for reading practice should focus on adult themes. A more precise principle might state that the materials should relate to the specific interests and goals of the students. To be more precise, the principle could suggest specific approaches to identifying student interests and goals and linking them to materials. Even when a principle is very precise, teachers and programs would have wide latitude on how they meet the demands of that principle.

Some principles might apply to all students. For example, a set of principles might define actions that programs should take to support student persistence. If students do not persist long enough in their studies, they may not make progress. Comings, Parrella, and Soricone (1999) identified some general supports to persistence (such as goal setting and building self-efficacy) that may be helpful to most students. Some principles might apply to specific groups of students. For example, a set of principles might establish specific instructional strategies for empirically distinguishable sub-groups of students. Strucker and Davidson (2003) suggest that students whose reading skills are low but sufficient to pass the GED test may need direct instruction that improves their oral vocabulary and fluency to be successful in postsecondary education.

Defining, Testing, and Using the Baseline Program Models

The principles for each element of the baseline program model are not identified in this paper. These principles should come out of a comprehensive process of inquiry, dialogue, and debate among academic and practitioner experts. Published sources for these principles include:

- *Program Standards for Adult Education ESOL Programs* (TESOL, 2000).
- *Research-based Principles for Adult Basic Education Reading Instruction* (Kruidenier, 2002a).
- *Looking at Literacy: Indicators of Program Quality* (Cook, 1996).
- *Principles for Effective Literacy and Basic Skills Programs* (Massachusetts Interagency Literacy Group, 1990).
- *Beyond Rhetoric: Adult Learning Policies and Practices* (OECD, 2003).
- *Reading and Adult English Language Learners: A Review of the Research* (Burt, Peyton, and Adams, 2003).
- Research reports and reviews of research published by NCSALL, the U.S. Department of Education, the National Center for Family Literacy, the Conference Board, the Goodling Institute for the Study of Family Literacy, the National Center on Adult Literacy, and others.
- Research reports and reviews of research on K-12 and postsecondary education.

A group of academic and practitioner experts would help identify sources, judge the quality of the evidence, and make decisions about which principles should define the program models. In a description of a program model, each principle would include the evidence that supports it and an indication of the strength of that evidence.

The program models that emerge would look like existing good programs, but they may have principles that are drawn from research but have not been widely implemented. For example, Reder & Strawn (2001) have identified a surprising amount of self-study undertaken by high school dropouts, some of whom have adult education program experience and some of whom do not, but most programs do not identify supporting self-study as part of their services. A baseline program model, therefore, might include a principle that supports self-study (possibly through technology) that is connected to classroom participation and other program services.

Once a baseline program model is defined, it should be tested in several research sites around the country. Each site would be a partnership between a research team and an established adult education program. NCSALL's labsites (NCSALL, 2002) in Oregon and New Jersey are examples of how these research sites could operate. Each research site would implement and evaluate the baseline program models. After the program model evaluation, the research sites would continue to support implementation of the program models. Each site could then undertake basic and applied research about how to improve elements of a program model and evaluate the impact of those improvements. Once an improvement is shown to be effective at one site, the other research sites could evaluate the same improvements.

Establishing an Evidence-based Adult Education System

Establishing an evidence-based adult education system is a process that follows a set of recurring steps. Those steps are:

- A review of existing research and practitioner knowledge informs the design of baseline program models.
- Research sites are established.
- Baseline program models are evaluated to establish their outcomes and impact.
- Practitioners use the results of these program model evaluations to make decisions about their practice.
- Practitioners share their experience of putting the program models into practice.
- Researchers study the implementation of the program models and pursue additional basic and applied research.
- Based on the experience of practitioners and additional basic and applied research, elements of the program models (or even new program models) are proposed and evaluated in the research sites.
- The results of the program model evaluations suggest revisions of program models or confirm the existing program models, and practitioners use the results to make decisions about their practice.

This process would continue improving and testing program models. Once models are well developed in research sites, they should be tested in a variety of programs around the country.

This system follows what Kuhn (1996) describes as *normal science*, in which researchers accept a common theory and develop it through increments of improvement. In an evidence-based adult education system, practitioners would all be working with the same baseline program models. They could, therefore, easily share insights into how to make those program models work in practice. Professional development would be more productive because practitioners would be working in programs that support the new techniques they learn in professional development activities. Researchers could more easily communicate their findings and be influenced by practitioners, because practitioners would understand the program models being studied. Kuhn points out that a weakness of normal science is that it can lead researchers to avoid exploration of new theories, and so an evidence-based adult education system must spend some resources on basic and applied research that explores alternatives to the accepted program models.

Integrating Research, Practice, and Policy

Once program models in adult education are proven effective, they could serve as a framework for an accreditation system for accountability purposes (Comings & Stein, 1991). The accreditation system is the accountability system used in postsecondary education. Funding agencies could ask programs to demonstrate that their services conform to the principles set out in the baseline program models. If a program does not conform to the principles set out in the program models, it could be helped to make changes. Program model evaluations would also provide benchmark standards for persistence, achievement, and impact in programs that conform to the principles in the program models. If a program conforms to the principles that describe the program models but its students have persistence, achievement, and impact rates that are significantly under the benchmark standards, the program could be helped to identify why this is so and how it might improve to meet those standards.

The adoption of program models would have to be supported by program and professional development services. A national system for technical assistance and training could help practitioners and state policymakers work together to analyze and plan how to apply new basic and applied research and program model evaluation findings in their classrooms and programs. This system could also build a dialogue among researchers, practitioners, adult students, and policymakers that would help to focus research on questions of relevance to the field, and it could provide a mechanism for sharing practitioner knowledge.

Next Steps

To move from this paper to the establishment of an evidence-based adult education system requires the following steps.

- Define groups of students to focus on in the initial baseline program evaluations. The students in each group should have needs and goals that are in a narrow range. For example, the groups could include:

  1. ESOL students who are literate in their native language and test at or below SPL4[9] on the BEST.[10]
  2. ESOL students who are literate in their native language and test at or above SPL5.
  3. GED[11] students whose literacy skills are at or above the 8th grade level as measured by a test such as the TABE[12] or CASAS.[13]

[9] The BEST has 10 Student Performance Levels.
[10] The Basic English Skills Test is published by the Center for Applied Linguistics in Washington, D.C.
[11] The General Educational Development test provides certification of skills and knowledge equivalent to those of a high school graduate.

4. ABE students whose literacy skills are between the 6th and 8th grade level.
5. ABE students with literacy skills below the 6th grade level.
6. ESOL students who are not literate in their native language.

- Identify specific achievement outcomes, and tools for measuring them, for each group of students. Kruidenier (2002b) has reviewed the available tests for ABE students, and Van Duzer and Berdan (2000) have reviewed the available tests for ESOL students. For GED students, the practice test score and final test score could be a suitable measure for achievement, but assessment tools for GED students should also measure improvements in academic vocabulary, as well as transition and success in postsecondary education and training. For some students, measures of a broader set of skills, such as those identified by the Equipped for the Future initiative (Stein, 2000), or specific skills, such as those identified by the family literacy approach (Morrow, Tracey, and Maxwell, 1993), may also be appropriate.

- Choose a few groups to begin with first. Criteria for choosing groups for the first program model evaluation might be that a group is representative of a large percentage of the existing student population, is likely to show improvement in the existing measures of achievement and impact, has instructional needs that can be met with existing program models, are presently underserved, and are identified as an important target group by the U.S. Department of Education.

- Support a team to develop the baseline program models for each group. These teams would work with a group of academic and practitioner experts to identify principles for the baseline program models. They would also engage policymakers, practitioners, and students in a discussion of how to balance the limits on funding and the barriers to learning in the lives of potential students with the evidence from research.

- Engage research methodology experts to design an evaluation of the baseline program models.

- Publish a detailed description of the baseline program models and the program model evaluation methodology.

The publication of this document would be followed by the establishment of research sites for the evaluation of the baseline program models. Since the baseline program models would be based on the best available empirical evidence and practitioner knowledge, funding agencies could begin using them for professional development, program design, and accountability purposes.

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[12] The Test of Adult Basic Education is published by McGraw-Hill in New York, New York.
[13] The Comprehensive Adult Student Assessment System is published by CASAS in San Diego, California.

A Call for Support

The vision presented in this paper describes an adult education system that rests on a foundation of the best available empirical evidence and practitioner knowledge. Establishment of an evidence-based adult education system would require substantial funding for a difficult, multi-dimensional research agenda. It would also require funding of a national system for integrating research, practice, and policy through professional development and the sharing of practitioner knowledge.

Focusing the adult education system's existing research and development funds on building an evidence-based adult education system should lead to greater funding when the public and private sector leaders who want to lend support to our field feel confident as to how to use their resources and influence. More importantly, the students who invest their time in adult education programs deserve services that employ the best available empirical evidence and practitioner knowledge and have strong evidence of effectiveness. Now is the time to make this investment.

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NCSALL

National Center for the Study of Adult Learning and Literacy

NCSALL's Mission

The National Center for the Study of Adult Learning and Literacy (NCSALL) provides information used to improve practice in programs that offer adult basic education, English for speakers of other languages, and adult secondary education. In pursuit of this goal, NCSALL has undertaken research in four areas: learner motivation, classroom practice and the teaching/learning interaction, staff development, and assessment.

NCSALL conducts basic and applied research; builds partnerships between researchers and practitioners; disseminates research and best practices to practitioners, scholars, and policymakers; and works with the field of adult literacy education to develop a comprehensive research agenda.

NCSALL is a partnership of the Harvard Graduate School of Education, World Education, Rutgers University, Portland State University in Oregon, and the Center for Literacy Studies at the University of Tennessee in Knoxville. NCSALL primarily receives funding from the U.S. Department of Education's Office of Educational Research and Improvement.

NCSALL's Dissemination Initiative

NCSALL's dissemination initiative focuses on ensuring that the research results reach practitioners, administrators, policymakers, and scholars of adult education through print, electronic, and face-to-face communication. NCSALL publishes research reports, occasional papers, research briefs, and teaching and training materials; the quarterly journal *Focus on Basics*; and *Review of Adult Learning and Literacy*, an annual scholarly review of major issues, current research, and best practices.

For more information about NCSALL, to download free copies of NCSALL publications, or to purchase bound copies, please visit:

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